

While all of these modalities are eventually effective in rendering patients wart-free, complex factors influence treatment selection by both patient and provider. There is clearly no ideal treatment for all patients or for all warts.

Genital warts are caused by the low-risk genital human papillomaviruses (HPV) types, predominantly HPV 6. While at least 50% of the sexually active population in the U.S. are infected with one or more HPVs, only 1% have external genital warts. These HPV types have little, if any, malignant potential. As we have learned to distinguish these types from the high-risk types associated with cervical cancer, there has been a general tendency toward less aggressive therapy.

The goal of treatment of genital warts is the removal of symptoms, which can be emotional as well as physical. Physical symptoms include pain, burning, and bleeding and are relatively rare. The emotional impact of having active viral STD is significant, however.

While there is no convincing evidence that patient-applied therapies are superior to provider-administered therapies, an important consideration is patient preference. In the long term, the major effect of genital warts on many patients is not the bumps or growths, but rather the emotional consequences of this infection on them, their relationships, and their sexuality. The availability of patient-applied therapies allows the patient to have some control over this difficult problem.

The major question is whether the patient wishes the physician to treat the warts or wishes to treat the warts him/herself. In addition, there is a need for education about the natural history of HPV infection. Although HPV infection and external genital warts are common, many patients before diagnosis have heard of neither.

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Lasers for Removing Unwanted Hair and Rejuvenating Skin

THE USE OF LASERS for treating a variety of skin diseases demonstrates the precision and selectivity provided by these devices that reduce the risk of complications and enhance the opportunity for a satisfactory outcome. Several of the newest uses for lasers are removing unwanted hair and rejuvenating sun-damaged or aged skin.

Removal of hair with little discomfort and excellent long-term results by light from lasers or non-laser sources can be accomplished with two different techniques. The first technique employs the topical introduction of a car-

bon-based material in mineral oil into the hair follicle that absorbs infrared light from a Q-switched Nd:YAG laser. The mechanism of action for this technique is a combination of thermal and mechanical injury to the germinative cells of the follicle that are in contact with the carbon particles. A second technique uses the absorption of light by melanin—found between matrix cells in the hair bulb and in the structural elements of the hair shaft medulla, cortex and cuticle—to injure the hair follicle. The mechanism of action for this group of lasers is largely thermal. In order to have an effect on hair growth, precise damage must be done to follicle germinal cells. Since the absorption spectrum for melanin is broad, many wavelengths of light from several different devices can be used to remove hair. The Food and Drug Administration (FDA) has given clearance for treating unwanted hairs to the long-pulse ruby, the alexandrite and diode lasers as well as an intense light source. Some of these devices use contact or spray cooling to reduce thermal injury to the pigmented epidermis as the treatment is being performed. The use of non-laser light from a flashlamp that produces an intense source of white light that is filtered to deliver wavelengths greater than 590 nm for effectively removing unwanted hair has recently been reported. This system allows adjustments in both the pulse duration and wavelength, depending on the clinical situation and the color the patient's skin and hair to provide additional flexibility.

All current treatment techniques for removing hair are performed in ambulatory settings either without anesthesia or with topical anesthesia alone. The treatment may produce minimal postoperative edema or transient erythema lasting 24–48 hours. Although hair follicles have tremendous regenerative capabilities that vary greatly from individual to individual and from one anatomic site to another, typically a delay in hair regrowth will average 3–6 months after a single treatment. Treating the same area sequentially as hairs begin to regrow improves the response by reducing the caliber and lightening the color of the remaining hairs and increasing the number that are permanently removed. Recently, the long-pulse ruby laser has received FDA clearance to use the term “permanent reduction” in hair following treatment, based on analysis of long-term followup data. Unlike the technique employed with electrolysis, which treats only one hair at a time, all of these new devices allow for the simultaneous treatment of many hairs with a single pulse of light, so that relatively large areas of involvement, such as the legs, chest or back, can be treated quickly. The cost of performing this treatment is generally dependent on the size of the treatment area and the time required to perform the treatment.

Treatment options for rejuvenation of sun-damaged or aged skin have been radically changed by the recent introduction of short-pulsed, high-energy carbon dioxide lasers. These devices precisely remove the solar damaged epidermis and dermis, tighten collagen, and greatly improve the appearance of most patients. However, reports of prolonged erythema, occasional scarring, and permanent hypopigmentation reduced the acceptance of

this technique and led to the introduction of the erbium:YAG laser for skin rejuvenation. The high coefficient of absorption by water for the erbium:YAG laser greatly minimizes the amount of unwanted collateral thermal injury, speeds healing time and reduces postoperative erythema. The erbium:YAG laser technique is generally most useful for younger patients or those individuals with early signs of photodamage. This is due to the fact that many more repetitions or passes are required during the single treatment session to achieve the same depth of ablation as with the carbon dioxide laser. However, reduction in side effects with this laser system make it a welcome addition to the techniques used in treating

sun-damaged or aged skin. The cost of performing laser skin resurfacing is generally similar or slightly higher than the cost associated with the older dermabrasion technique but with the added benefits of greater precision, rapid healing and a more predictable outcome.

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